

out of 50 patients who had raised counts over the calf positions. The radioactive counts decreased on subsequent days. According to criteria adopted for the diagnosis of DVT none of the 50 patients developed DVT. Clinical signs and symptoms were absent in all 50 patients.

Discussion

DVT is regarded asymptomatic in about 50% of patients. If diagnosed earlier the morbidity and mortality can be reduced by early treatment. Iodine 125 fibrinogen uptake test is the most sensitive method to diagnose DVT at the earliest possible moment⁵. Almost all the thrombi originating during and after the surgery are situated over the calf position and in the calf they first originate in the soleal sinuses⁶. The venous Doppler examination is a rather crude method for screening the patients at risk and this technique is not successful in detecting the calf thrombi⁷. FUT findings are consistent with phlebography as a whole but are more accurate in case of the calf because in this part of the limb radiologist cannot display all the intramuscular veins⁸. In one study Jorgansen et al⁹ evaluated the efficacy of low molecular weight heparin in the prophylaxis of postoperative DVT and the diagnostic test most often used was FUT. DVT increases almost linearly with advancing age as confirmed by autopsy

reports of hospitalized patients^{3,10}. There is increased risk of DVT among the females¹¹. Some investigators found an equal ratio of 1:1 in male and female⁵. Surgical procedures, general anaesthesia and postoperative bed rest are other risk factors for the development of DVT. Patients with severe injury are more prone to develop DVT¹². Paralysed patients and others who are completely immobilized are considered to be at increased risk of thromboembolism. In our 50 patients no evidence of DVT was found in spite of the high risk factors such as their age, sex, duration of operation and postoperative bed rest. This explains the contribution of racial, geographical and dietary factors in the development of DVT. Although these preliminary findings need further evaluation, the results of our study however, confirm our clinical impression that DVT is very rare in this part of the world even in the absence of prophylactic measures.

Acknowledgements

We very much appreciate and thank Dr. Anayat Ullah, M.D. 333-St. Paul Ste. 1A, Baltimore 21202, U.S.A. who very graciously arranged the supply of Human Fibrinogen for this study. Our gratitude is also due to the Dr. Faiz ur Rehman, PhD, Radio Pharmacist of INMOL for labelling the fibrinogen with isotope.

References

1. Chumnijarakij T, Poshyachinda V: Post operative thrombosis in Thai women. *Lancet* 1975;1:1357-58.
2. Cheng KK, Lai ST, YU TJ et al: Post operative deep vein thrombosis in the Taiwanese Chinese population. *Am J Surg* 1987;153:302-5.
3. Nandi P, Wong KP, Wei WI et al: Incidence of post operative deep vein thrombosis in Hong Kong Chinese. *Br J Surg* 1980;67:251-53.
4. Flanc C, Kakker VV, Clark MB: The detection of venous thrombosis of the leg using I-125 labelled fibrinogen. *Br J Surg* 1968;55:742-47.
5. Atkin P, Hawkin LA: The diagnosis of deep vein thrombosis in the leg using iodine-125 fibrinogen uptake test. *Br J Surg* 1968;55:825-30.
6. Pinto DJ: Controlled trial of an anticoagulant (warfarin sodium) in the prevention of venous thrombosis following hip surgery. *Br J Surg* 1970;57:349-52.
7. Lensing AWA, Levi MM, Buller HR et al: Diagnosis of deep vein thrombosis using objective Doppler method *Ann Inter Med* 1990;113:9-13.
8. Brose NL: The iodine-125 fibrinogen uptake test. *Arch Surg* 1972;104:160-63.
9. Jorgensen LM, Wille-Jorgenson P, Hauch O.: Prophylaxis of postoperative thromboembolism with low molecular weight heparin. *Br J Surg* 1993;80:689-704.
10. Dismuke Se, Wagner EH: Pulmonary embolism as a cause of death, *JAMA* 1986;255:2039-42.
11. Sripad S, Antcliff AC, Martin T: Deep vein thrombosis in two district hospitals in Essex. *Br J Surg* 1971;58:563-65.
12. Ruiz AJ, Hill SL, Berry RE: Heparin, deep vein thrombosis and trauma patients. *Am J Surg* 1991;162:159-62.

Diagnosis of Deep Vein Thrombosis in the Leg Using I¹²⁵ Fibrinogen Uptake Test: A Preliminary Study

M Afzal M Rafi M Akbar M A Shahid

Department of Surgery Postgraduate Medical Institute Lahore

Correspondence to : Dr Muhammad Afzal

The incidence of postoperative deep vein thrombosis (DVT) in a series of 50 patients admitted for General Surgical and Gynaecological operations has been studied using I¹²⁵ labelled fibrinogen. No evidence of DVT was obtained by fibrinogen uptake test (FUT) even in the absence of prophylactic measures.

Key Words : Deep vein thrombosis (DVT), Fibrinogen uptake test (FUT).

Post operative deep vein thrombosis (DVT) is often regarded rare in Asians. In Thai women incidence is very low (1.7%) even after major surgical procedures for benign and malignant conditions¹. In Chinese population of Taiwan the incidence of DVT is 7.7%². In Hong Kong the incidence is 2.6%³. As there is no documentation of the incidence of DVT in Pakistan, we studied this subject in the patients admitted for elective surgery; using I¹²⁵ labelled fibrinogen. This is an initial report of 50 patients.

Patients and Methods

The patients undergoing major surgical procedures under general anaesthesia were selected for study (Table 1). This study was conducted at Lahore General Hospital which is a teaching hospital attached with Postgraduate Medical Institute, Lahore. Thirty male and 20 female patients of age 40-70 were selected. A major operation was defined as any surgical procedure under general anaesthesia lasting for more than 30 minutes and likely hospital stay for at least 5 days³. Patients who had history, clinical signs of recent DVT and those who underwent leg or thyroid operation or having surgical wounds, trauma, fracture, superficial phlebitis, cellulitis, arthritis, haematoma and oedema in the area being monitored were excluded from the study. The pregnant and lactating mothers were also excluded. Human source fibrinogen was obtained from Sigma Chemical Company (Product No.855-2) USA. The product is collected from a selected pool of donors to reduce the risk of serum hepatitis and AIDS. The fibrinogen is supplied in freeze dried form in a vial containing 200 mg of fibrinogen. Labelling of fibrinogen facility was provided by Institute of Nuclear Medicine & Oncology, Lahore (INMOL). One milligram of fibrinogen was labelled with 100 millicuries of iodine-125 sufficient to use in one patient. The radio activity counting apparatus was provided by INMOL. This apparatus consisted of a scintillated collimator with an aperture diameter of 2 inches connected to a scalar land timer. Patients selected for study were given 100mg of Potassium Iodide 24 hours prior to I/V injection of Iodine-125 labelled fibrinogen to block the thyroid gland and was continued for 4 weeks. The legs were marked from the centre of the groin to ankle for counting of radioactivity at the points marked. Iodine-125

Table 1 Type of Operations

OPERATION	NO. OF PTS.
Abdominal Hysterectomy	6
Vaginal Hysterectomy	4
Myomectomy	1
Laparotomy	5
Hepatobiliary Surgery	9
Closure of Colostomy	1
Transvesical Prostatectomy	1
Interval Appendicectomy	1
Inguinal Herniorrhaphy	16
Paraumbilical Hernia Repair	2
Epigastric Hernia Repair	1
Haemorrhoidectomy	1
Pedicle Graft Chin	1
Mastectomy	1
TOTAL	50

fibrinogen was injected into arm vein one day before operation and radioactivity measured after 1 hour. This provided a baseline for subsequent measurements of radioactivity. With the patient lying supine the legs were elevated to 30 degrees from the bed to decrease venous pooling and to give access to the calf for the scintillated collimator. The timer was adjusted for 30 seconds and uptake activity measured at each point already marked. Counting was repeated when the patient returned from the operation theatre and on first, third and sixth post operative day. If an increase in uptake activity occurred then the counts were measured daily. The patients were examined daily for clinical symptoms and signs. The criteria adopted for the diagnosis of DVT was that there must be an increase in counts of 20% or more compared with the counts at the same point on the previous day, with the adjacent point on the same limb and with the corresponding point on the opposite limb. Persistent increase in counts at a point and further increase at this point on subsequent days was considered evidence of thrombosis as adapted by Flanc et al⁴.

Results

The diagnosis was based on Iodine-125 labelled fibrinogen uptake and daily assessment of physical signs. The results for DVT were negative in 50 general surgical and gynaecological patients. There were 47 patients with normal radioactive counts In 3